

Available online at www.sciencedirect.com**ScienceDirect**

Procedia - Social and Behavioral Sciences 116 (2014) 3462 – 3466

Procedia
Social and Behavioral Sciences5th World Conference on Educational Sciences - WCES 2013

Learning about sustainable community development

Mirela-Adriana Szitar*

Department of Architecture, Faculty of Architecture, "Politehnica" University of Timisoara, Traian Lalescu 2, 300223, Timisoara, Romania

Abstract

Community development is one of the most debated subjects related to sustainability. Collaboration between various stakeholders and disciplines will be essential for the success of every project related to these issues. The paper contains an analysis of the changes made in recent years in relation with sustainability issues in higher education and a presentation of a case study related the introduction of sustainable community development into the architectural design curriculum. It proves that all the successful projects related to sustainability issues share the same vision, having a clear purpose, well-defined objectives and teaching methods that emphasize integrated learning.

© 2013 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and/or peer-review under responsibility of Academic World Education and Research Center.

Keywords: Community, education, interactive techniques, sustainable development

1. Introduction

Sustainable development is the critical issue for the 21st Century, requiring action at all levels of society, including in a wide variety of professions. Collaboration between professions will be essential for success. This requires that all professionals have the knowledge, skills and awareness to work with others, in order to make a significant contribution for sustainable development. This has been recognised by UNESCO, which has declared the years 2005 to 2014 to be the Decade of Education for Sustainable Development. While sustainability becomes the central issue of the international agenda, most Higher Education Institutions have to respond now, in a systematic and coherent way in terms of embedding sustainability concepts, values and skills into the student learning experience.

Higher education institutions bear a moral responsibility to increase the awareness, knowledge, skills and values needed to create a just and sustainable future. As A.D. Cortese said, higher education has unique academic freedom, the critical mass and diversity of skills to develop new ideas, to comment on society and its challenges. Why, then, it is so averse to risk and difficult to change? Because the change sought is a deep cultural shift – the most difficult to achieve – but the most important leverage points for institutional transformation.

2. Sustainable development and higher education

Currently the higher education curriculum is dominated by the mechanistic paradigm. Sustainable education suggests and requires a shift towards an ecological paradigm. There are two main theoretical approaches of this

* Mirela Adriana Szitar name. Tel.: +40-722-493909

E-mail address: mirela_szitar@yahoo.com

paradigm shift. The first one takes into account the different levels of engagement in education for sustainable development. While education about sustainability has a content emphasis and can be easily accommodated into the existing system, education for sustainability has a values and skills emphasis, it promotes learning for change. Sustainable education has a capacity building and action emphasis. It promotes reflective learning as change.

The second approach refers to various types of interaction between the disciplines involved. In most cases concerning sustainable development in higher education, the main topic is considered the shift from multidisciplinary to trans-disciplinary or from education for sustainability to sustainable education. But the main problem to be solved in the next years is to integrate all these components in the built environment curricula, surpassing the barriers that may occur at different levels (individual, social and institutional).

2.1. Teaching about sustainability in the built environment disciplines

Several years ago, only a few architectural and civil engineering faculties had sustainable design as a central issue of education and practice and the same was true in the education of virtually every intellectual discipline and profession. Today, we can see this paradigm shift toward sustainability, which emphasizes the importance of collaboration and cooperation.

To achieve sustainable development in the future, there is an increasing need for teaching of interdisciplinary sustainable development skills in higher education institutions. However, there are also difficulties in achieving successful teaching projects. Many universities in Europe promote sustainable development in their education. Compulsory courses are permeated by this perspective. There are also multidisciplinary and trans-disciplinary courses. Teachers create networks within and between their universities to support sustainability.

Fortunately, today there are hundreds of examples of change fostering sustainable community education, in both ways – changing the types of the interaction between the stakeholders involved and changing the level of engagement in education for sustainable development: interdisciplinary projects (interdisciplinary staff team from various faculties in the same university), postgraduate courses, projects developed in partnership with local and regional communities or with non-profit organizations (www.secondnature.org, www.display-campaign.org, www.sdeurope.org, www.solardecathlon2014.fr). What do all these projects have in common? They all have a clear purpose, well-defined objectives and the teaching methods that foster integrated learning.

2.2. The top-down and the bottom-up approaches

There are two main options to hand for the implementation of sustainable development education into the formal education system. On a large scale, the implementation of sustainability into higher education requires a shift from the actual mechanistic paradigm to an ecological paradigm - the top-down approach, while at a small scale it requires a specific bottom-up approach.

Curricula reform must be a priority if institutions are to embed sustainability in their teaching. The methods used in European universities are: the rigorous review of the curricula, the implementation of credible teaching materials, which are contextualised and relevant to each subject area, the investment made in staff development, the creation of a network within the universities and the development of a multidisciplinary and an interdisciplinary approach (rather than using a ‘sustainability champion’ who develops specific courses focused on sustainability).

But this top-down approach is not enough. „If the Universities do not collaborate with local and regional communities and do not involve the faculty, the teachers and the students as an integral part of the education process, they will lose 75 percent of the values of its efforts and will not fulfil their role in the society” A. D. Cortese highlights. At a small scale, the implementation of sustainability in built environment disciplines requires a specific bottom-up approach. There is a number of approaches to foster integrated learning, such as: project-based learning, cooperative learning, team learning and active learning, problem solving, reflective practice, community involvement.

A survey about postgraduate education in sustainability within the built environment disciplines (through COST 25 network) shows that in the European countries there is little movement towards the less-traditional methods

considered more effective (critical thinking, active learning – 50%, problem solving – 33% and reflective practice – only 16%). This survey demonstrates that a broad-based effort is needed to make sustainable design a core part of architectural and civil engineering education in the next decade (McCullough and Hayles).

3. Introducing sustainability issues in architectural education – case study

During the past three years a group of young teachers has changed the traditional methods previously used in the second year of study in the Faculty of Architecture in Timisoara in the architectural design discipline in order to introduce sustainability issues and a new approach towards community development.

3.1. Case study – sustainable community development

In the second year of study, the main theme in the architectural design discipline is individual housing. The decision was to introduce the issues related to sustainability and sustainable community development in the first phase of the project in different ways, using different methods and approaches.

During the academic year 2010-2011 the first exercise of this type was made. First of all the decision was to choose the general topic of the development: greening an industrial site (a former basalt quarry) and creating an ecological community. The second step was to invite specialists from different areas: a specialist in greening industrial sites and environmental protection, a sociologist and some landscape designers. The third step was to use some effective methods of learning: project-based learning, reflective practice, team learning and active learning.

In the first phase the students worked in big groups of 25 to 30 persons (each group with two teachers). In this phase of the project the first step was the site visit, followed by free discussions and organization of the working groups and the site analysis.

In the second phase, after three weeks of team work and lectures held by the invited specialists (sociologists, specialists in greening the disused industrial sites, landscape architects) each group proposed a greening strategy and a small eco-community on a part of the rehabilitated site. This part of the project, related to community planning and sustainable community development, was a team work. At this stage each group was divided into three subgroups of 8 to 10 students that formed a smaller group that could interact easier, in order to take its own decision and to bring its creative contribution to the community. This part will be analyzed further.

In the third phase the project followed the usual approach: an individual project for a house. But even in this stage the students must cooperate in order to provide a coherent response and to assure the success of the final project. This part of the project was mainly an individual work.

3.2. PAPSA method of stimulating creativity and interactive techniques for groups – study of the process

In order to face this exercise, stimulation of creativity and using of interactive techniques for groups were considered key factors for its success. PAPS method of stimulating creativity is the one that fully explains the discontinuous creation process that many authors previously defined (Wallace, Rossman, Osborne, Bandrowski). The theme of creative and analytical balance is carried over into all the models proposed for specific applications. PAPS means: Presentation, Analysis, Production, Selection and Application.

Each of the five stages of a full creative approach includes a divergent phase and a convergent phase. For each stage various creative and interactive group techniques can be applied. During the divergent phase an open field of possibilities is created, without censoring the ideas. The convergent phase is a phase of gathering the ideas and channelling the energies in order to find one or more original, efficient and feasible solution(s). During the divergent phases, the main interactive techniques used were: brainstorming and cognitive maps. During the convergent phases, the main techniques used were: critical thinking (Ennis), problem-based learning (Hmelo-Silver, Osborn) and meta-cognitive strategies (Swanson).

All the interactive techniques used in various phases are described and analyzed by various authors (Cerghit, Neacsu, Oprea).

The table below presents the five stages, the interactive techniques for groups used and errors that may occur during the process, as shown by analysis of the second phase of the project.

Table 1. Stages, interactive techniques and errors that may occur – analysis of the second phase of the project

Stages	What is / to be done	Interactive techniques	Errors that may occur during the process
Presentation	-Lectures held by invited specialists -Theme and objectives presentation	-Effective expository strategies -Meta-cognitive strategies	-Weak definition of the topic (teacher) -Lack of clarity in presenting the objectives (teacher) -Lack of perception ingenuity, insufficient attention and openness (student)
Analysis	-Research for sustainable community development -Conclusions derived from the previous site analysis	-Problem-based learning -Critical thinking -Learning by discovery	-Weak definition of convergent phase, of classification and prioritization (student and teacher) -The important conclusions of the previous phase or those of this phase are not sufficiently clarified
Production	-Generating different alternatives -Ranking the issues to be solved	-Brainstorming -Cognitive maps -Learning by discovery -Meta-cognitive strategies	-Low group creativity in the divergent phase (student) -Not taking into account all variables involved -Losing sight of the main objective presented in the first phase (student and teacher) -The teacher provides solutions instead of providing directions for study, leading to de-motivation, loss of student independence in making judgments
Selection	-Selection of the most suitable solution, that responds to the main objectives -Addressing all aspects (community development, climate, ecology)	-Brainstorming -Heuristic strategies -Critical thinking -Problem-based learning -Meta-cognitive strategies	-Unresolved aspects, usually secondary objectives of the theme (student) -Lack of attention for all the aspects and details involved in solving a complex issue in a group (teacher)
Application	-Phase completion -Presentation of group work	-Heuristic strategies -Meta-cognitive strategies	-Lack of consistency, the project does not meet a minimum standard of the basic concept and realization (student) -The teacher' feedback is not clear enough, so that the student remains with a wrong impression about his/her performance and result

3.3. Using interactive techniques for groups in the project – advantages and barriers, strengths and weaknesses

There are many advantages to using group interactive techniques, such as: working in a group is stimulating and it motivates students to learn, issuance of multiple and varied assumptions facilitates solving complex tasks, interaction is important for self-discovery of student's capabilities and limits, people who work in teams are able to apply and synthesize knowledge in complex and varied ways and learning is more profound, teamwork helps develop multiple intelligences, teamwork stimulates and develops divergent thinking and critical thinking, minimizes the emotional blockage of creativity, collective interaction results in the education of self and tolerant behavior to the opinions of others.

Possible barriers to learning through group interaction techniques are: the lack of maturity of the group, participants lose motivation due to perceived inequality, consensus, unanimity of opinions, the fear of having a personal opinion different from that of the group, lack of ability to work in groups.

Referring to the use of group techniques in the project, we can say that the main strengths of the approach were: maintaining the enthusiasm of all the people involved (students, teachers, invited specialists) and perceiving the multiple responsibilities – for the environment (as a general issue), for the community they were part (as a specific issue of the project) and for their own learning process, in school and in life (as an individual issue). The most important weakness was the difficulty of cooperation in larger groups of students. The best way to handle the

problem in the first part of the project was to assign every small group of 3-4 persons a specific area of study in order to gather informations and to generate a coherent response at global level (each group worked as a “group of specialists” in their domain). It has been proved that the groups that worked best were the groups where the students knew each other well and were organized from exterior (by the teachers). These were also the groups that have not lost enthusiasm and who have maintained motivation until the end of the project.

Active learning, reflective practice and accountability of students proved to be very beneficial not only in the learning process, but also in creating a better cohesion in the group. The entire project was monitored, being the first project of its kind in our faculty. At the end of every stage of the project performed in groups the students made a general presentation in order to receive the feed-back from all the teachers involved and also from their colleagues.

The feed-back provided at the end of students and teachers demonstrated that the project was a success. It promoted reflective learning for both groups, as they learned from each other and from the invited specialists during the whole process. This approach is a step forward towards sustainable education and a movement towards a multi-disciplinary approach of the built environment that is needed for the future.

4. Conclusions

In many universities in Romania and Eastern Europe the change in the teaching and learning process began only a few years ago. The problems and the barriers are similar to those which are present in other European countries. But „the significant problems we face cannot be solved at the same level of thinking we used when we created them” Einstein once said. Everybody agree that the paradigm shift must occur in the next one to two decades. The issue is not the ability of higher education to take on this challenge. It is the will and the time frame for doing so. The next phase requires professionals that are able to implement changes. Sustainable practitioners will have to be able to provide solutions in a holistic manner. That is why higher education needs to prepare the students to make a change, personally and professionally.

References

- Cerghit, I. (2006). *Metode de invatamant*. (4th ed.). Bucuresti: Polirom
- Cortese, A.D. (2003). The Critical Role of Higher Education in Creating a Sustainable Future. *Planning For Higher Education*, March-May 2003, 15-22.
- Ennis, R. H. (1987). A Taxonomy of Critical Thinking Skills and Dispositions. In J. B. Baron and R. J. Sternberg (Eds.), *Teaching Thinking Skills: Theory and Practice* (pp. 9-26). New York: Freeman.
- Hmelo-Silver, C. E. (2004). Problem-Based Learning: What and How Do Students Learn?. *Educational Psychology Review* 16(3), 235–266.
- McCullough, J.E. & Hayles, C.S. (2009). Education for Sustainable Development – Interim Paper for COST C25. *Sustainability of Construction – Integrated Approach to Lifetime Structural Engineering* (pp.290-297). Timisoara: Editura Orizonturi Universitare
- Metcalfe, J. & Shimamura, A. P. (1994). *Metacognition: knowing about knowing*. Cambridge, MA: MIT Press.
- Neacsu, I. (2006). *Invatarea academica independenta – ghid metodologic*. Bucuresti: Editura Universitatii din Bucuresti.
- Oprea C. L. (2009). *Strategii didactice interactive*. Bucuresti: Ed.Didactica si Pedagogica
- Osborn, A. (1953). *Applied Imagination: Principles and Procedures of Creative Problem Solving*., New York: Charles Scribner's Sons.
- Swanson, H.L. (1990). Influence of metacognitive knowledge and aptitude on problem solving. *Journal of Educational Psychology*, 82, 306-314.